

As a 20 years-in-business ISP (Old Colorado City Communications) who has attempted to bring, or consult and advise others on broadband Internet and other types of connectivity, at the lowest possible cost, for small rural towns, schools and isolated locations in rural America (and foreign countries) and turned to unlicensed wireless in 1994, I am keenly aware of the limitations unlicensed wireless radios operating under current FCC Part 15 rules still has.

Only with the greatest difficulty, and degrading bandwidth, can places even 15 miles apart be connected, and even then only with favorable terrain, the accident of accessible towers or hills, and sparse vegetation, can non line of sight structures be connected with 35dbm EIRP limitations, at either 902-928mhz, 2.4-2.483Ghz or 5.2-5.8Ghz frequencies. Unlicensed spread spectrum, or UNII rules were made for urban environments, not rural.

The 1994 Telecommunications Act mandated that there be 'ubiquitous broadband' for all Americans. Which included the 25% of the US population which occupies fully 97% of the land area - with its long distances between population clusters and therefore much greater costs for communications, even with FCC Universal Service Fund subsidies. While the other 75% of the population occupies only 3% of the land area - the dense urban areas so attractive to many wired as well as wireless vendors - dedicated networks, DSL, Cable modems. But 8 years after the Act mandated such services, the telephone companies have failed to extend broadband to that 25% of rural areas.

Rural

Unlicensed wireless is the only solution for broadband connectivity for people in vast rural areas of the US. Therefore, the proposal made in this NPRM, that a new band of frequencies be opened up at 3.65 to 3.7Ghz to unlicensed use with a permitted 25 Watts, or 44db of power, EIRP is a welcome, if belated, advance in the effort to support rural populations with broadband. It will especially be good to supply Rural WISPS with better wireless service potential than they have now with current radios under old rules which never were envisioned for rural connectivity. Current rules are Urban-centric.

While 44db EIRP, with a nominal 200mw (23dbi) output radio, and a 20dbi directional antenna at each end, with the usual (for many commodity-quality current urban radios) -83dbm sensitivity will only extend 12 to 15 miles, if manufacturers offer radios with -94dBm - which better radios such as Cisco's can achieve, then ranges to 50 miles can be achieved with bandwidth greater than T-1. While even current Cisco radios with -94dbm and 2.4ghz (Wi-Fi) frequencies and 36dbi EIRP (20dbm and 16dbi antennas) cannot reach more than 15 miles, and then only at throughputs well below T-1.

If 44db radios are available, then towns can be reached in one, or two hops at most, backbone, while local distribution with Wi-Fi type radios becomes more feasible.

Urban

There is one totally overlooked - by the FCC - urban wireless need, and that is the local coverage from school buildings to the homes of both students and teachers who live inside the boundaries of school districts. My extensive experience with trying to 'connect up' schools. There are 84,000 schools in the US inside 16,000 school 'districts' serving 55 million K-12 students and 3 million local teachers, of which only 2,000 districts have K-12 education in one large building. The other 14,000 districts have multiple buildings inside the district, from 2 to as many as 50, AND the radius of distance to the periphery of districts are, in my experience, from 7 to 15 miles. IF enlightened school Boards could offer unlicensed broadband radio with the power (24 watts EIRP) from central buildings to all student's and teacher's homes inside district

boundaries (and either give or loan radios to all students) permitting them to 'reach' school servers even through some trees and walls, and even the Internet itself (paid for 24/7 by districts even though used only a fraction of the time - like perhaps 8 hours a school day) then the US could take a large step toward better home-work education, distance learning, and the learning of information age work habits - collaborative, distant, asynchronous - whether or not parents have or can afford broadband connections at home, or commercial net accounts.

The NPRM proposal can aid and abet, at greater power to cut through trees and vegetation, and walls, and reach further, than current FCC rule Wi-Fi radios, as well as permitting Districts to reach school buildings in the school district with backbone radios which can deliver more bandwidth than schools with only Wi-Fi radios.

Approve the NPRM proposed rules for 3.65 to 3.7Ghz as unlicensed frequencies and 24 watts for approved EIRP.

Accommodating licensed users inside these frequencies - such as specialized satellite operations can be worked out by the FCC and such users. Do NOT halt this proposal for such marginal, and very limited public value current uses for this frequency band. There are much greater public broadband needs which should, at last, be addressed.

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